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ONTARIO WATER
RESOURCES COMMISSION

ANNUAL REPORT

1962

TOWN OF PARKHILL

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MINISTRY OF THE ENVIRONMENT

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PARKHILL WATER PURIFICATION PLANT

OPERATED FOR

THE TOWN OF PARKHILL

BY

THE ONTARIO WATER RESOURCES COMMISSION

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Prepared by the
Division of Plant Operations.

PROJECT DEVELOPMENT

The Town of Parkhill approached the Ontario Water Resources Commission in 1957 to undertake the financing and operation of a new water treatment plant to reduce the amount of hydrogen sulphide in the existing well water supply which was causing objectionable tastes and odours.

After considerable research, it was found to be less expensive to treat the existing deep well supply rather than develop a new source.

The plant, based on OWRC laboratory developed pilot plant, was designed by Canadian-British Engineering Consultants of Toronto and construction was carried on by Pearce Construction Limited.

In August 1960, construction was started and on March 13th, 1961 the plant was put into operation. The plant is operated by the Parkhill Public Utilities Commission under the supervision of the Plant Operations Division of the Ontario Water Resources Commission. The plant was officially opened on June 13, 1962.

The total cost of the project was $ 158,700.00.

PROJECT DESCRIPTION

Design Capacity :-

The treatment works was designed for a capacity of 504,000 G.P.D. However the plant is limited by the well capacity of 100 G.P.M.

Existing Deep Wells :-

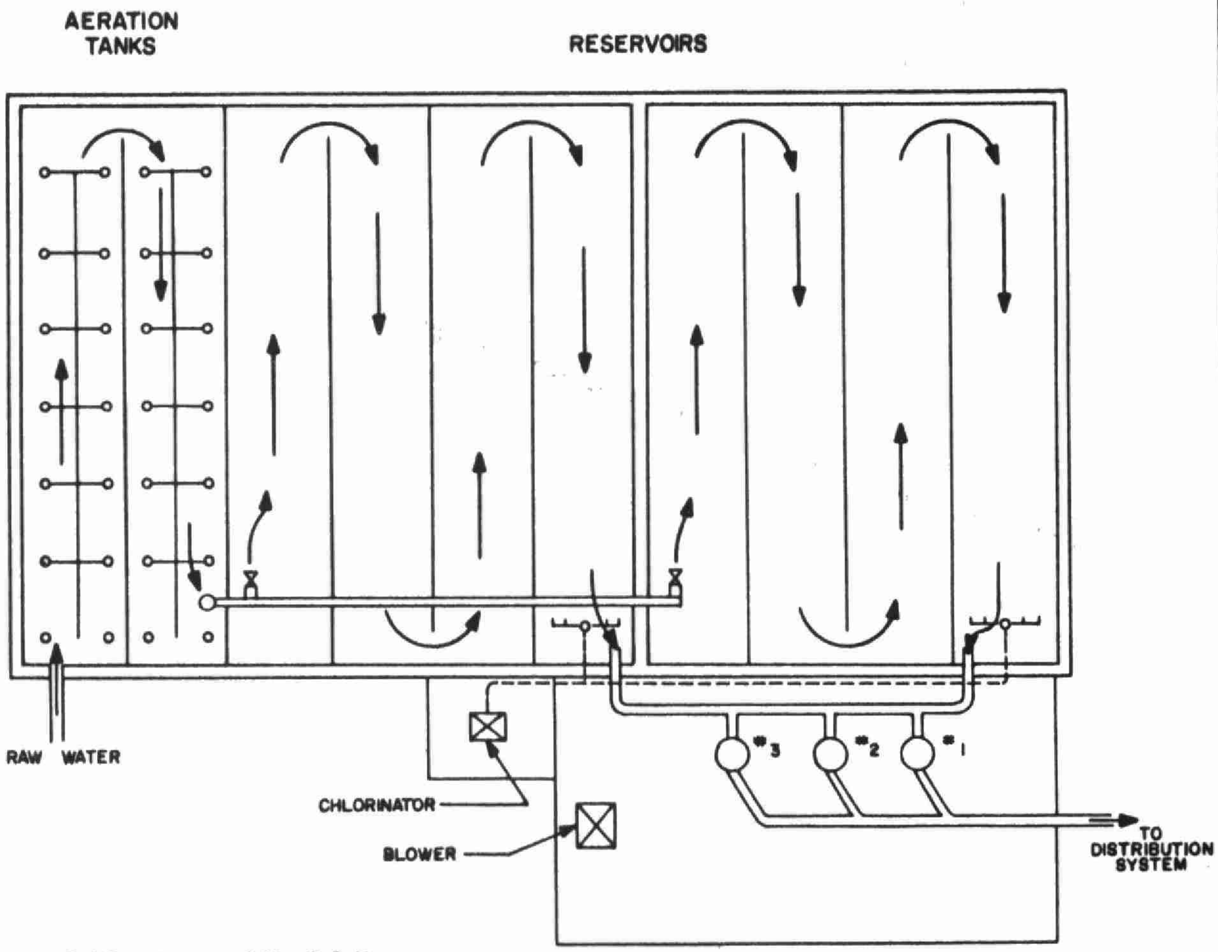
The two existing deep wells are located at Broadway and Albert Streets. Well # 1, 130 feet deep with 6 inch diameter casing, is equipped with a Layne vertical turbine pump having 240 G.P.M. (U.S.) capacity at 240 ft. head driven by a 22 HP electric motor. This pump is equipped with a combination belt drive type head suitable for use with a tractor type engine for standby. The pump is controlled automatically by a pair of electrodes located in the ground storage reservoir at the treatment plant.

Well # 2, 130 feet deep with 4 inch diameter casing, is equipped with a Layne vertical turbine pump having 150 G.P.M. (U.S.) capacity at 245 foot head driven by a 15 HP electric motor. This pump is also equipped with a combination belt drive head.

An aquifer test was made by International Water Supply Limited during August 1961. This test indicated an aquifer capacity of 100 G.P.M. which could be obtained from one well. The wells are approximately 12 feet apart.

PARKHILL

WATER TREATMENT PLANT



PUMP	1	200	G.P.M.
PUMP	2	500	G.P.M.
PUMP	3	200	G.P.M.

OWRC MARCH 1963 O.F.

FLOW

During 1962 the total amount of water treated was 41,584,000 gallons with the average daily flow being 113,900 gallons.

TREATMENT PLANT

Aeration - The water is pumped from the wells to the aeration chambers through a 6 inch asbestos cement pipe approximately 4,500 feet in length. There are two rectangular aeration channels each 42 feet x 7 feet - 8 inches x 12 feet which provides a total volume of 48,200 gallons. A retention period of 2.5 hours is provided at the design flow of 350 G.P.M.
350 x 60 x 24 = 503,000 G.P.D.

A Rotary Positive Blower type AF size 55, supplied by Roots-Connersville Blowers Limited is driven by a 7½ HP induction motor with pulley drive. The pulleys can be changed to alter the capacity of the blower. The capacity is 130 CFM with a discharge pressure of 6 psig at 1150 R.P.M.

There are 28 Colaflex Air Diffusers (14 in each channel) supplied by Infilco Limited. The diffusers are capable of passing a maximum of 5 CFM under a 10 foot head of water. Provision has been made for inflating and deflating the diffusers by means of a three-way valve located on the air main from the blower to the diffusers.

The oxygen supplied through the diffusers, displaces the hydrogen sulphide in the water and the ventilation system carries the displaced gas to the atmosphere. Some of the hydrogen sulphide that is not removed is oxidized to free sulphur and

settles out in the settling tank.

Settling Tanks - The effluent from the aeration channels is discharged to the settling reservoir by means of an 8 inch diameter pipe. Settlement is obtained in the storage reservoir. The reservoir is divided into two equal compartments with each compartment having four sections each 42 feet x 8 feet 3 inch x 12 feet. The total volume of both reservoir compartments is 208,000 gallons. The settling tanks are operated in series, however, provision has been made for draining each compartment separately. On draining one compartment of the reservoir, the drainage passes to a 100,000 gallon capacity leaching pool for solids removal with a 6" diameter drain to Parkhill Creek.

Chlorination - Chlorination has been provided for hydrogen sulphide removal. A Fischer and Porter gas chlorinator, model C-1420, feeds chlorine proportional to the high lift pumpage. It is equipped with a 20 lb. orifice. The ultimate capacity of the machine is 1000 lbs. per 24 hours. There are four points of chlorine application. Chlorine can be added to the water by means of an Uscolite Diffuser located in the last section of each compartment of the reservoir. This provides not less than 15 minutes contact. Two other points of application are located on the high lift suction lines from both compartments of the reservoir. The chlorinator is equipped with a weigh scale and manifold for connecting two cylinders.

High Lift Pumps - There are three high lift pumps delivering the water to the distribution system from the reservoir.

1 - A Fairbanks-Morse horizontal centrifugal pump with 50 to 200 G.P.M. capacity at 115 ft. head

1 - cont'd ....

driven by a variable speed drive 15 HP electric motor. The variable speed drive is operated by a dynomatic control which regulates the pumpage automatically with the pressure in the distribution system.

2 - A Fairbanks-Morse horizontal centrifugal pump with 500 G.P.M. capacity at 167 foot head driven by a Dorman diesel engine.

3 - Same as # 1 without variable speed drive. When this pump is operating at 200 G.P.M. a pressure valve regulates the amount of return to the ground reservoir.

The Autocon System Controls regulate the speed of pump # 1 automatically with the pressure in the distribution system. This pump is operated continuously while the other two pumps are started manually.

<u>Flow Meter</u> :-

A totalizer and recording flow meter has been supplied by Bailey Metering Company.

<u>Distribution System</u> :-

There is no elevated or ground storage in the distribution system. The treated water is pumped into the distribution system through 1,050 feet of 8 inch diameter asbestos cement pipe. The distribution system is mainly cast iron pipe.

The pressure leaving the plant is maintained at approximately 52 psi.

TABLE # I

PARKHILL

MONTH	AVERAGE DAILY FLOW (gals)	AVERAGE CHLORINE USED (lbs)	AVERAGE CHLORINE DOSAGE (ppm)
January			
1 - 6	93,560	11.0	11.8
7 - 13	98,023	11.7	11.9
14 - 20	104,400	10.9	9.6
21 - 27	99,170	10.7	10.8
28 - 31 February 1 - 3	97,300	10.9	11.2
4 - 10	109,000	12.4	11.4
11 - 17	99,257	11.1	11.2
18 - 24	98,900	11.1	11.2
25 - 28 March 1 - 3	102,700	11.6	11.3
4 - 10	104,400	12.0	11.5
11 - 17	116,457	9.6	8.2
18 - 24	99,429	10.0	10.1
25 - 31	99,771	10.3	10.3
April			
1 - 7	107,657	10.3	9.6
8 - 14	103,886	9.3	9.0
15 - 21	103,200	10.6	10.3
22 - 28	106,800	9.7	9.1

Cont'd ....

MONTH	AVERAGE DAILY FLOW (gals)	AVERAGE CHLORINE USED (lbs)	AVERAGE CHLORINE DOSAGE (ppm)
29 - 30 May 1 - 5	108,800	7.6	7.0
6 - 12	107,800	5.9	5.5
13 - 19	137,100	6.6	4.8
20 - 26	140,571	7.0	5.0
27 - 31 June 1 - 2	143,486	8.6	6.0
3 - 9	147,100	10.1	
9 - 16	123,900	9.3	7.5
17 - 23	134,060	6.6	4.9
24 - 30	136,100	9.2	6.8
July			
1 - 7	160,285	12.3	7.7
8 - 14	174,100	14.6	8.4
15 - 21	168,343	14.5	8.6
22 - 28	114,900	11.0	9.6
29 - 31 August 1 - 4	119,829	8.9	7.4
5 - 11	118,500	6.9	5.8
12 - 18	121,370	5.9	4.9
10 - 25	123,600	6.4	5.2
26 - 31 September	119,500	6.9	5.8

Cont'd ....

MONTH	AVERAGE DAILY FLOW (gals)	AVERAGE CHLORINE USED (lbs)	AVERAGE CHLORINE DOSAGE (ppm)
September			
1)			
2 - 8	109,500	6.0	5.5
9 - 15	114,800	5.1	4.4
16 - 22	115,000	5.0	4.3
23 - 29	115,000	6.1	5.3
- 30) October) 1 - 6)	116,000	7.9	6.8
7 - 13	107,800	8.9	8.3
14 - 20	115,700	11.9	10.3
21 - 27	108,000	10.3	9.5
28 - 31) November) 1 - 3)	100,629	9.7	9,7
4 - 10	99,000	8.9	9.0
11 - 17	99,600	9.6	9.7
18 - 24	100,100	9.6	9.7
25 - 30) December) - 1)	97,200	9.7	10.0
2 - 8	109.400	10.3	9.4
9 - 15	96,900	10.0	10.3
16 - 22	93,700	10.3	11.0
23 - 29	89,800	9.0	10.0

Total Flow -- 41,584,000

Average Daily Flow-113,900

Graph # 1 indicates the percent of days during 1961 and 1962 that the flow exceeded a specific amount. It can be seen that in 1961, 50 percent of the time the daily flow was 120,000 gallons per day, while in 1962, 50 percent of the time the daily flow was 110,000 gallons per day.

In 1962 the flow pattern became less erratic and 90 percent of the time the daily flow exceeded 86,000 gallons per day while 10 percent of the time the daily flow exceeded 140,000 gallons per day.

Graph # 2 indicates the annual flow variation with the average daily flows during a week being plotted.

Table # 1 shows the average daily flows for weekly periods.

OPERATION OF THE TREATMENT PROCESS

The raw water, which is pumped to the treatment plant from the deep well, contains approximately 50 ppm of hydrogen sulphide. To reduce this quantity of H_2S to an acceptable level without creating other undesirable side effects is a very delicate operational problem

Hydrogen Sulphide Removal :-

Sampling and testing for hydrogen sulphide has been done since the summer of 1962 to evaluate the efficiency of the water treatment plant.

The results vary slightly with each set of samples but, in general, the results are as follows :-

Raw Water	-	50 ppm
After Aeration	-	10 ppm
After Reservoir Storage	-	5 ppm
After Chlorination	-	1 ppm

In general, the water going into the distribution system has an H_2S content of 1 ppm. Samples are taken from the east, south and west extremities of the system by the project engineer on a regular basis. These samples show a hydrogen sulphide content varying from 0.8 to 4.0 ppm with most samples having a 1.0 ppm concentration.

Aeration :-

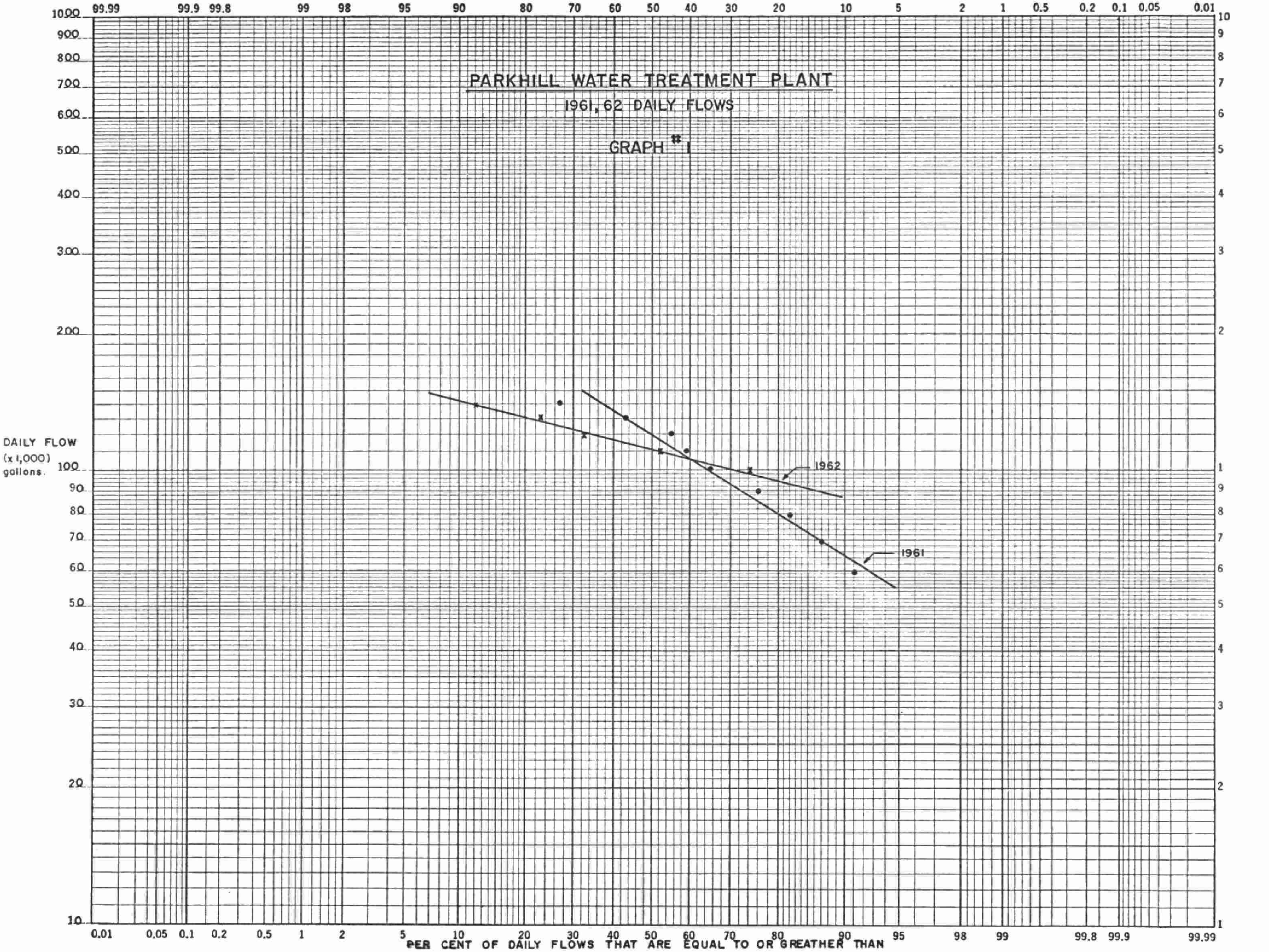
The raw water is pumped directly into the first pass of a two pass aeration tank. The air, which is supplied by a 130 CFM positive displacement blower, enters the tank via 28 "Colaflex" diffusers. In order to efficiently displace H_2S as a gas, the pH should be as close to 5.0 as possible. For example, at pH 5.0 the percentage of total sulphide present as H_2S gas is 98 whereas at a pH of 7.7 (Parkhill raw water) there is only 9 percent of the total sulphide present as H_2S gas. The remainder of the sulphide content is present as alkaline sulphides. There, the sulphides cannot be removed by aeration alone. Removal of H_2S by aeration with no pH control also produces another problem. The H_2S gas which is displaced by air results in an increase in the pH. Thus, it becomes progressively more difficult to displace the remaining H_2S, as discussed above.

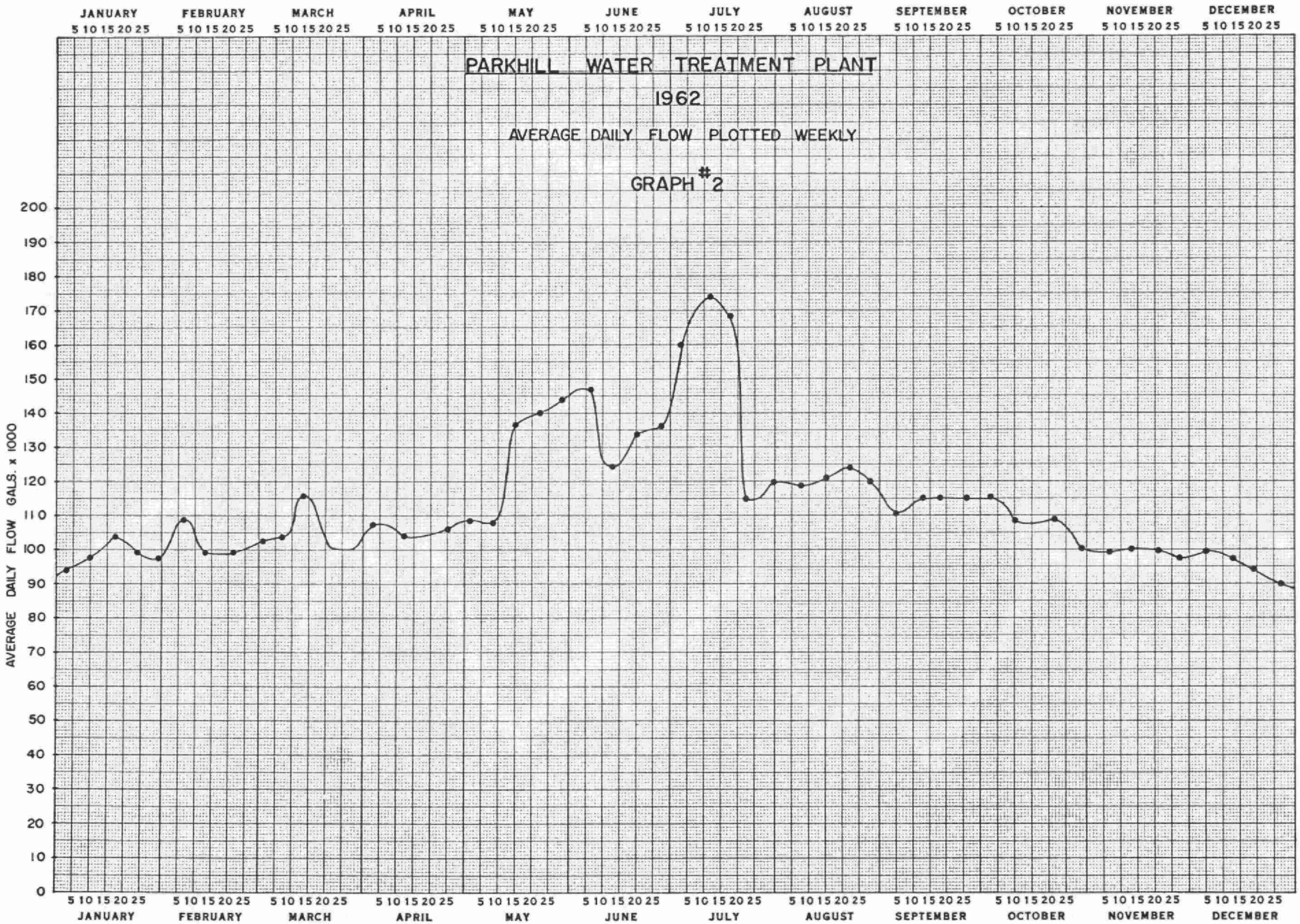
There is a critical volume of air which must be exceeded before any significant amount of H_2S gas can be displaced. This point can only be determined experimentally at the plant. At present, approximately 66% of the air supply is delivered to the first pass of the aeration tank. This may not be the optimum setting and may be changed with varying operating conditions.

During aeration, the pH of the water is raised to approximately 8, and at this high pH only 5% of the sulphides are present as gas, the remainder being present in the form of alkaline sulphides. The adsorption of oxygen (approximately 8 ppm) by the water during aeration assists hydrogen sulphide removal by oxidizing the alkaline sulphides to free sulphur. The quantity of free sulphur which settles out in the aeration tank and the reservoirs is quite large and must be flushed out of the tanks on a monthly basis.

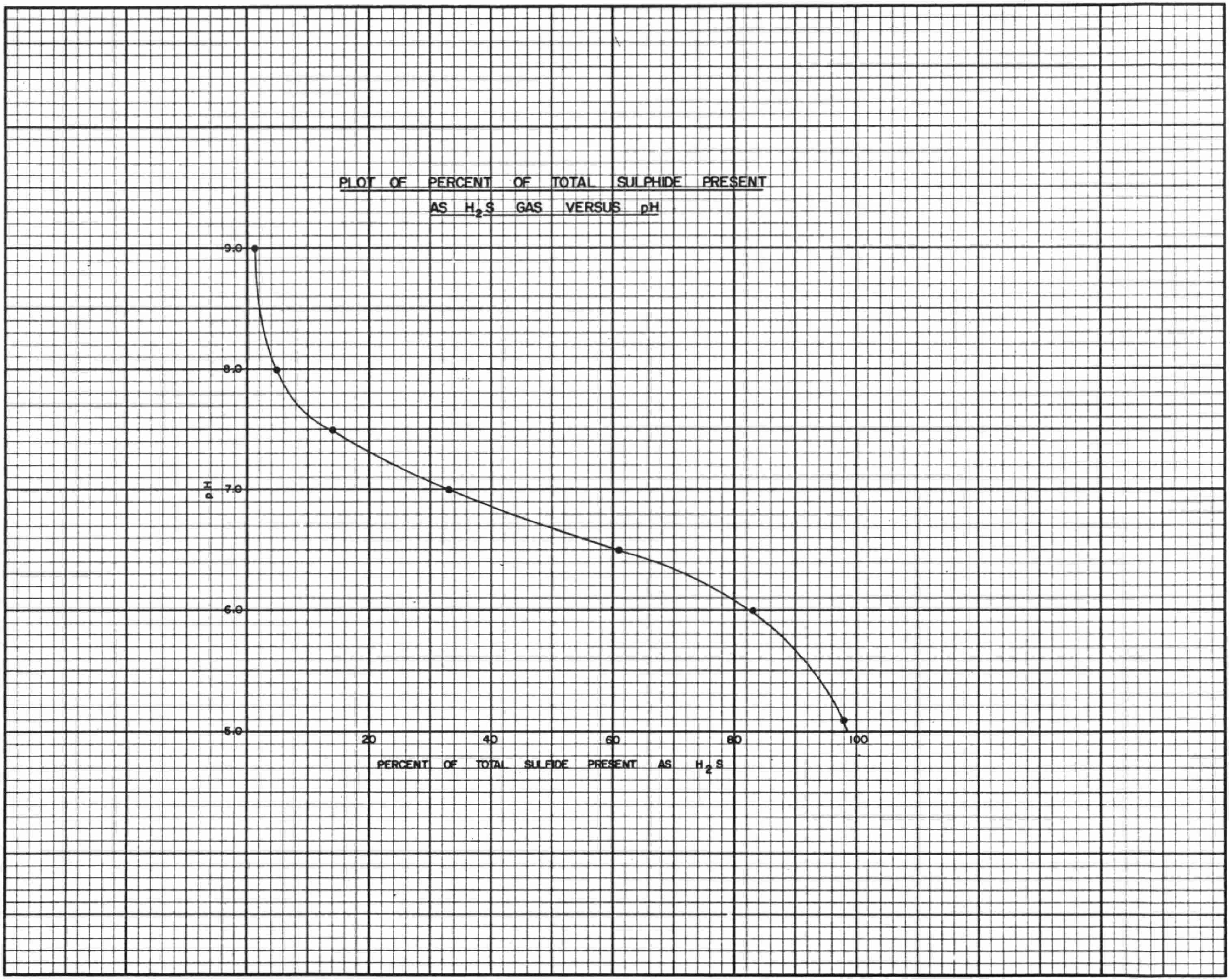
Tests in the OWRC laboratory have proven that there are sulphur reducing bacteria growing in the aeration tank and reservoirs. These organisms reduce the free sulphur which has settled out and convert it back to H_2S.

To flush out the free sulphur which has settled out, it is necessary to enter the tank and scrape and hose the deposits. In the past, this was a very difficult, dangerous and time consuming task because of the small hose line. In addition, the operator carried coliform bacteria into the tank when cleaning. Many unsatisfactory bacteria analyses were obtained during 1962 as seen in Table 2.


PARKHILL WATER TREATMENT PLANT
1961, 62 DAILY FLOWS
GRAPH # 1
DAILY FLOW
(x 1,000)
gallons.
1962
1961
PER CENT OF DAILY FLOWS THAT ARE EQUAL TO OR GREATHER THAN



PARKHILL WATER TREATMENT PLANT
1962
AVERAGE DAILY FLOW PLOTTED WEEKLY
GRAPH # 2
AVERAGE DAILY FLOW GALS. x 1000
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
5 10 15 20 25
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200


PLOT OF PERCENT OF TOTAL SULPHIDE PRESENT
AS H_2S GAS VERSUS pH
9.0
8.0
pH
7.0
6.0
5.0
20
40
60
80
100
PERCENT OF TOTAL SULFIDE PRESENT AS H_2S

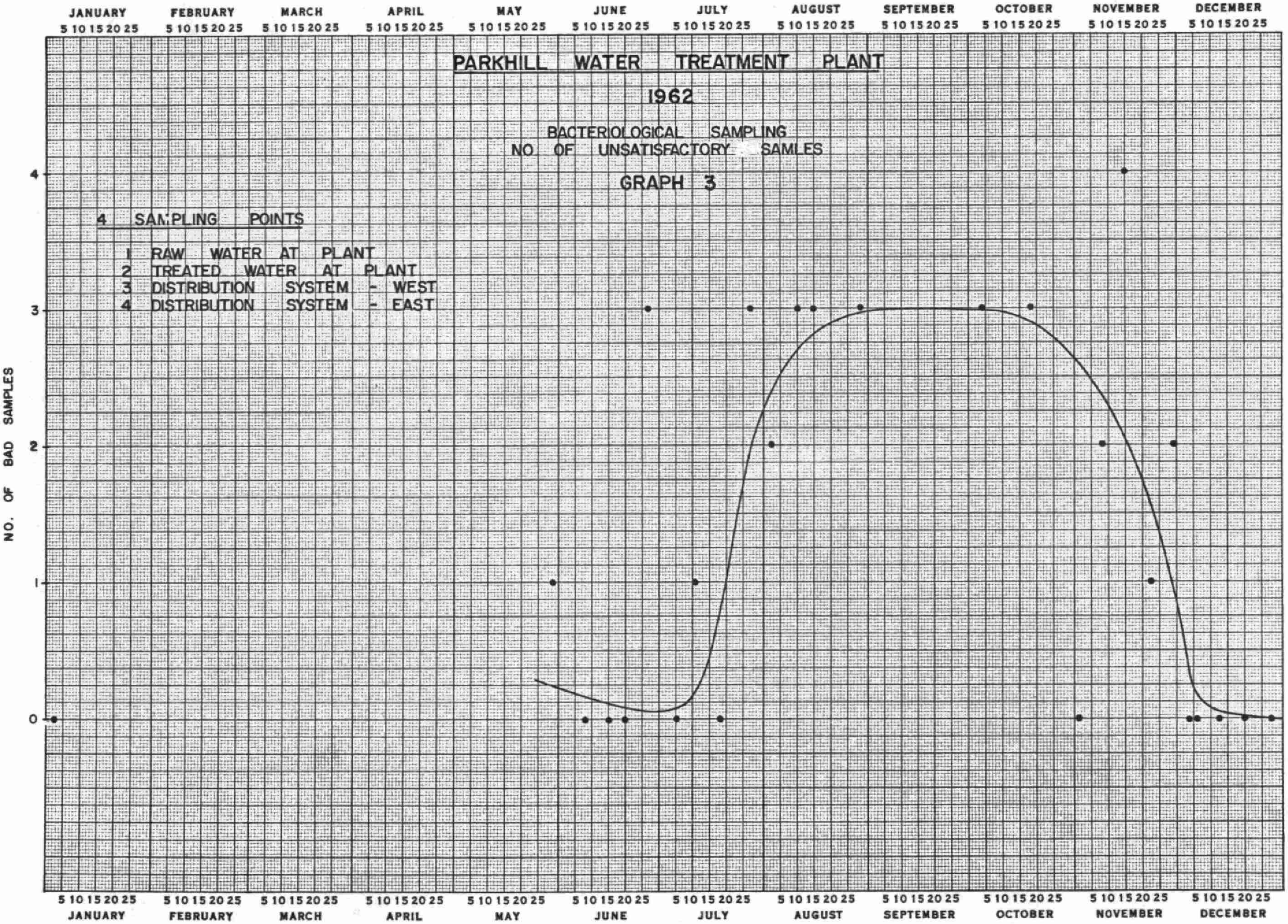
Unsatisfactory coliform tests were more prevalent during the periods when the chlorine dosage was at a minimum. Comparisons of Graph 3 and Graph 4 show that during June and July the chlorine dosage of approximately 7 ppm resulted in generally satisfactory coliform tests whereas during August and September when the chlorine dosage was reduced to approximately 5 ppm the coliform tests were generally unsatisfactory. During October, November and December when the chlorine dosage was raised to approximately 9.5 ppm the coliform tests again became generally satisfactory. It should be pointed out that chlorine is added at Parkhill to assist in the final removal of H_2S and not for disinfection. The raising of the chlorine dosage above that which is required for H_2S removal creates problems in the distribution system which will be discussed later.

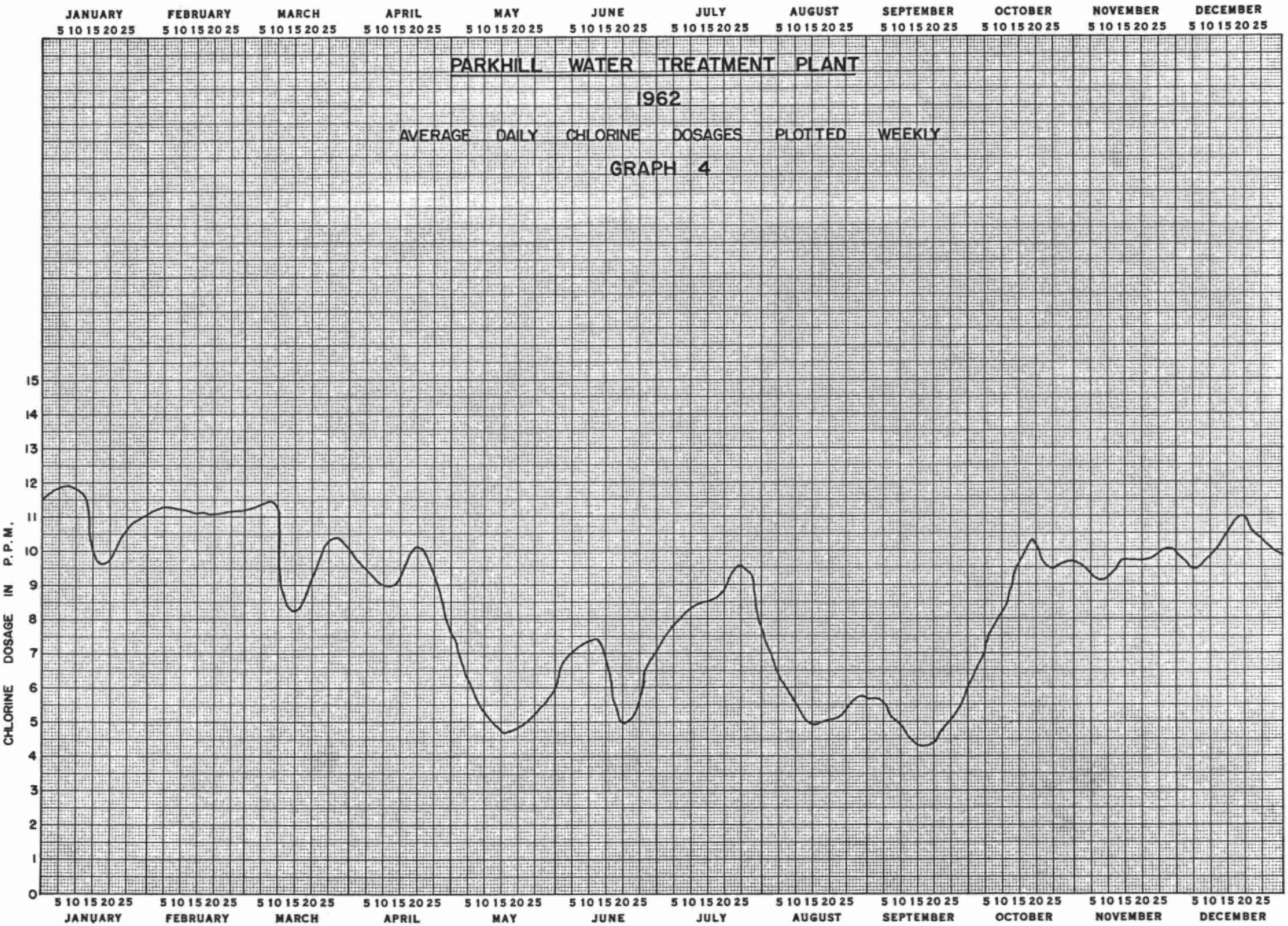
However, to make the removal of settled sulphur easier and to reduce the possibility of contaminating the water a larger hose line attached to the standby pump was installed. A connection from the chlorine feed line to the hose line permits the tanks to be flushed with chlorinated water. It is hoped that these measures will reduce the source of contamination without creating problems in the distribution system

TABLE 2

BACTERIOLOGICAL EXAMINATION

Date		Coliforms per 100 ML Sample Points 1	2	3	4	Grade Sample Points 1	2	3	4
May	30	0	1	0	0	A	B	A	A
June	8	0	-	0	0	A	-	A	A
June	15	0	0	0	0	A	A	A	A
June	20	0	0	0	0	A	A	A	A
June	27	-	12	9	3	-	C	B	B
July	5	0	0	0	0	A	A	A	A
July	11	0	-	0	4	A	-	A	B
July	18	0	0	0	0	A	A	A	A
July	27	0	57	13	2	A	C	C	B
Aug.	2	0	3	0	0	A	B	A	A
Aug.	10	0	4	3	2	A	B	B	B
Aug.	15	0	6	3	15	A	B	B	C
Aug.	29	0	8	2	2	A	B	B	B
Oct.	4	0	5	2	2	A	B	B	B
Oct.	18	2	5	3	0	B	B	B	A
Nov.	1	0	0	0	0	A	A	A	A
Nov.	8	0	3	1	0	A	B	B	A
Nov.	15	1	25	6	1	B	C	B	B
Nov.	22	1	0	0	0	B	A	A	A
Nov.	29	<10	0	1	0	B	A	B	A
Dec.	4	0	0	0	0	A	A	A	A
Dec.	6	0	0	0	0	A	A	A	A
Dec.	13	0	0	0	0	-	A	A	A
Dec.	20	0	0	0	0	-	-	-	B
Dec.	28	0	0	0	0	-	A	A	A


PARKHILL WATER TREATMENT PLANT
1962
BACTERIOLOGICAL SAMPLING
NO OF UNSATISFACTORY SAMLES
GRAPH 3
4 SAMPLING POINTS
1 RAW WATER AT PLANT
2 TREATED WATER AT PLANT
3 DISTRIBUTION SYSTEM - WEST
4 DISTRIBUTION SYSTEM - EAST
NO. OF BAD SAMPLES
0
1
2
3
4
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
5 10 15 20 25


PARKHILL WATER TREATMENT PLANT
1962
AVERAGE DAILY CHLORINE DOSAGES PLOTTED WEEKLY
GRAPH 4
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
5 10 15 20 25
CHLORINE DOSAGE IN P.P.M.
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

Chlorination :-

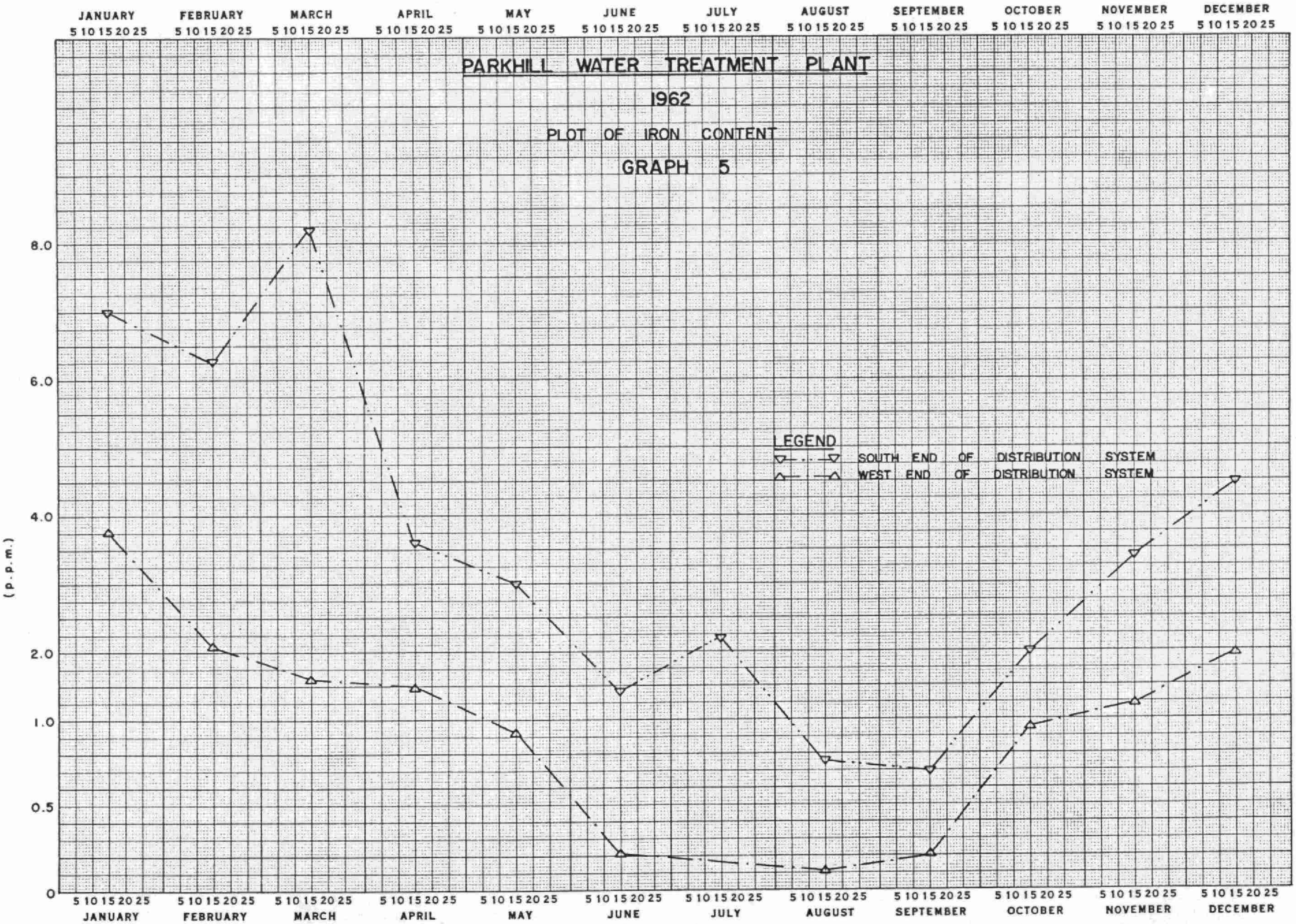
Chlorine is added to the water at the end of the reservoirs to oxidize the H_2S which remains after aeration and sedimentation. The chlorine feed rate is equally as delicate an operation as the air supply rate.

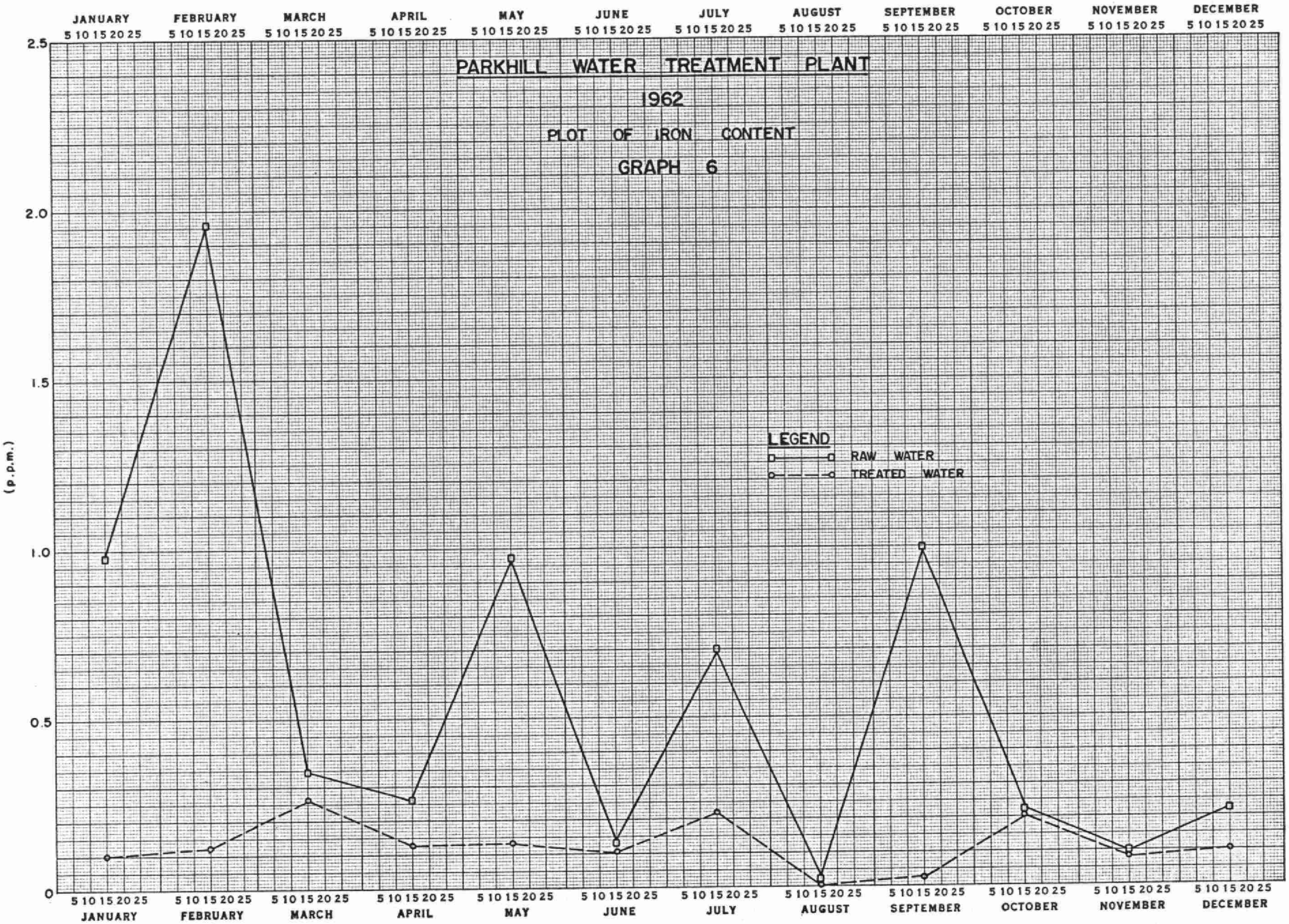
The reaction between chlorine and hydrogen sulphide is as follows :- $H_2S + Cl_2 = 2\ HCl + S$

For the removal of each pound of hydrogen sulphide 2.1 pounds of chlorine are required.

On the average, the water after aeration and sedimentation contains approximately 5 ppm. Consequently approximately a 10 ppm dosage of chlorine is theoretically needed. However, comparing Graph No. 4 with Graph No. 5 it is seen that during January, February and March when the chlorine dosage was approximately 10 ppm the iron content of the water in the south and west end of the distribution system was high. During May the chlorine dosage was reduced and the iron content was reduced. During June and July the chlorine dosage was raised and the iron content in the system showed a rise. During August and September when the chlorine dosage was reduced to its lowest level, the iron content in the system also reached its lowest level. During October, November and December the chlorine dosage was again raised and the iron content in the system rose.

From these comparisons, the complexity of the operation can be appreciated. Aeration to remove the hydrogen sulphide creates free sulphur which must be flushed out by the operator entering the tanks. The operator causes a contamination in the tank which must be overcome by chlorine disinfection.


PARKHILL WATER TREATMENT PLANT
1962
PLOT OF IRON CONTENT
GRAPH 5
LEGEND
SOUTH END OF DISTRIBUTION SYSTEM
WEST END OF DISTRIBUTION SYSTEM
(p.p.m.)
8.0
6.0
4.0
2.0
1.0
0.5
0
5 10 15 20 25
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER


PARKHILL WATER TREATMENT PLANT
1962
PLOT OF IRON CONTENT
GRAPH 6
LEGEND
RAW WATER
TREATED WATER
(p.p.m.)
2.5
2.0
1.5
1.0
0.5
0
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
5 10 15 20 25

The additional chlorine required for disinfection. The additional chlorine required for disinfection creates dirty and rusty water in the distribution system.

The black colour can be attributed to iron sulphides, the rust to iron oxides and the greyish to free elemental sulphur. The iron sulphide and oxide pick-up in the mains increase as the pH decreases and the water becomes more aggressive. The operator attempts to adjust the chlorine dosage to maintain a minimum pH of 7.4 and preferable in the range 7.5 to 7.6.

DISTRIBUTION SYSTEM

The Parkhill distribution system, which has been in operation for the past 40 years, contains large encrustations of iron sulphides and iron oxides. Assuming that the water leaving the treatment plant was of the highest quality, (i.e. non-aggressive and zero H_2S) the consumers would continue to receive water with a black or rusty colour and a bad odour for many years as long as the watermain encrustations remained.

The physical distribution system has grown over the years and various size watermains have been put in. The distribution system has never been engineered nor on a planned basis and consequently there are many dead ends and pipes of inadequate size. The original pipe diameters have been further reduced, in some areas to ¼ their original inside diameter by the layers of encrustations.

According to a watermain map of the town, the watermains consist of the following sizes :-

8" diameter	-	3800'
6" diameter	-	8000'
4" diameter	-	7500'
2" diameter	-	400'
1½"diameter	-	1200'
1¼"diameter	-	4200'
1" diameter	-	3000'
¾" diameter	-	3600'
½" diameter	-	2700'
Total:	-	34400 feet or 6½ miles of watermain.

It should be noted that 15100 feet or 44 percent of the watermains are smaller than 4" diameter.

The severity of colour and odour is not consistent throughout the distribution system. The poorest quality water appears to be in the southern part (the plant is located on the north side) and the extremities of the system. The outer extremities of the system are primarily supplied by $\frac{1}{2}$, $\frac{3}{4}$ and $1\frac{1}{4}$ inch diameter mains.

Samples of 4" diameter watermain and $1\frac{1}{4}$" watermain were tested in the OWRC laboratory to determine if the mains were capable of being cleaned chemically. It was found that the encrustations were so extensive and so hard that they were chemically impossible to remove in a practical manner. Large quantities of pure sulphuric acid were the only chemicals giving moderate success in removing the encrustations. Therefore, the chemical cleaning of the distribution is not possible.

Discussions have been held with representatives of the Raymond Concrete Pile Company Limited who represent the Centriline Corporation. The Centriline Process is capable of mechanical cleaning and cement lining watermains in place down to 4" in diameter. The cost of such work in these small sizes is approximately equal to replacing the original mains with new mains. It is also debatable as to whether the Centriline Process can be used in Parkhill because of the poor condition of some of the valves and fittings and the fact that the encrustations may be so large that they will prevent the machine from being drawn through. It is, therefore, recommended that

the mechanical cleaning and cement lining of the 4" diameter and larger watermains not be considered further.

The most satisfactory and the most expensive solution to the problem would be to install a completely new distribution system.

A rough estimated cost for providing a properly engineered distribution system would be $ 175,000.00. It is possible, however, to proceed with a staged replacement program where, whenever old mains are replaced, an attempt is made to install asbestos-cement pipe with the proper valves and fittings. Steps should also be taken to reduce the number of dead ends in the system.

SUMMARY

Operation of the Parkhill Water Treatment Plant for the removal of hydrogen sulphide by aeration, sedimentation and chlorination has been very successful. In general, the H_2S concentration is reduced from 50 ppm to 1 ppm, an efficiency of 98 percent.

However, a serious set of additional problems has been created. These problems of black water, red rusty water are primarily due to the poor condition of the town distribution system which has been aggravated by an aggressive water created by chlorination required at the plant.

It has been pointed out that the distribution system consists of inadequately sized cast iron mains ending mainly in dead ends which are encrusted with iron sulphides and iron oxides.

To replace the existing system with a proper system is the only way of ensuring a consistently high quality water throughout the entire distribution system. The cost of such a solution is, of course, extremely high.

The present approach to the problem is to clean out the aeration tanks and reservoirs regularly and to flush the surfaces clean with high chlorinated water to prevent contamination. The operator will then provide a chlorine dosage which will reduce the remaining H_2S to a minimum but will not reduce the pH to the extent of creating an aggressive water.

The water being pumped into the distribution system will then be of the highest possible quality, but as pointed out previously, this will not guarantee that problems of black and

red water will not occur from time to time. These problems can only be avoided with a proper distribution system.

PARKHILL

RAW WATER

MONTH	HARDNESS as $CaCO_3$	ALKALINITY as $CaCO_3$	IRON as Fe	CHLORIDE as Cl	pH at Lab.
Jan.	590	94	0.98	180	7.9
Feb.	720	74	1.96	261	6.8
March	750	160	0.36	4	7.5
April	800	166	0.26	12	8.0
May	700	96	0.98	186	8.2
June	880	190	0.13	215	7.3
July	714	120	0.70	182	8.2
August	850	194	Trace	186	8.0
September	688	104	1.00	181	7.6
October	796	124	0.22	185	7.3
November	790	160	0.10	188	7.9
December	850	96	0.22	186	7.1
AVERAGE:	753	135	0.61	162	7.7

REPORT ON THE PRESENT STATUS

OF THE

PARKHILL WATER TREATMENT PLANT

MONTH	TAP AT PLANT (TREATED WATER)				
	HARDNESS as $CaCO_3$	ALKALINITY as $CaCO_3$	IRON as Fe	CHLORIDE as Cl	pH at Lab.
Jan.	730	142	0.10	191	8.1
Feb.	800	142	0.13	226	7.2
March	810	270	0.27	2	7.3
April	790	132	0.13	18	7.2
May	820	150	0.13	186	7.2
June	890	152	0.11	182	7.3
July	716	140	0.22	196	7.0
Aug.	830	134	Trace	183	7.0
Sept.	848	146	0.05	187	7.1
Oct.	838	140	0.22	196	7.2
Nov.	810	136	0.10	192	7.2
Dec.	860	134	0.10	178	7.2
AVERAGE:	808	153	0.13	160	7.3

PARKHILL

Distribution System West

MONTH	HARDNESS as $CaCO_3$	ALKALINITY as $CaCO_3$	IRON as Fe	CHLORIDE as Cl	pH at lab.
Jan.	730	136	3.80	184	7.4
Feb.	800	126	2.10	226	7.2
Mar.	810	274	1.64	2	6.9
Apr.	780	128	1.52	19	7.5
May	820	142	0.93	191	7.3
June	890	138	0.22	182	6.9
July *	720	132	1.20	195	6.9
Aug.	850	146	0.12	183	7.1
Sept.	834	142	0.22	188	7.2
Oct.	840	134	0.98	185	6.9
Nov.	810	140	1.25	193	7.1
Dec.	820	128	1.96	183	7.2
AVERAGE:	808	149	1.27	159	7.1

* Note: Not the same location as the other samples

PARKHILL

Distribution System South

MONTH	HARDNESS as $CaCO_3$	ALKALINITY as $CaCO_3$	IRON as Fe	CHLORIDE as Cl	pH at Lab.
Jan.	730	136	7.00	184	7.3
Feb.	800	140	6.30	246	7.3
Mar.	720	296	8.20	3	7.2
Apr.	800	144	3.60	189	7.6
May	820	140	3.00	196	7.1
June	840	154	1.40	178	7.3
July	744	152	2.10	195	6.5
Aug.	840	136	0.76	183	7.2
Sept.	720	154	0.60	188	7.3
Oct.	848	142	2.00	205	7.0
Nov.	810	144	3.40	194	7.1
Dec.	836	140	4.50	183	7.3
AVERAGE:	788	158	3.49	178	7.2

OPERATING COSTS

The total operating cost for the year 1962 was $ 2483.11. The largest portion of this sum is found in the sundry column. The $875.82 for July involves taxes paid to the Town of Parkhill, while the $815.49 in December is a three year premium for the insurance of the plant.

The next largest portion is found in the chemical column. This involves the chlorine used during the year and the purchase of a pH indicator.

The general supplies for the year amounted to $ 305.65 and pertained to such items as electronic tubes for automatic control, packing glands for pumps, time delay relay switches, motor starter lights and diffusers.

The equipment cost consisted of a bronze plaque in the building and the sign that is located at the road leading to the plant.

As mentioned previously, the insurance premium is for three years and expires on March 24, 1964. At that time the premium will be paid annually.

A liability insurance is also carried by the OWRC for bodily injury, property damage, and insurance against ill effects of the water through chemical treatment to the extent of $ 500,000 per incident. This policy costs the project $ 9.64 per year and is based on the water consumption of the previous year.

ONTARIO WATER RESOURCES COMMISSION

PROJECT OPERATION STATEMENT

1962

MONTH	EXPENDITURE	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	SUNDRY
Jan.	-----	-----	-----	------	-----
Feb.	145.25	123.75	21.50	------	-----
Mar.	-----	-----	-----	------	-----
Apr.	11.61	-----	1.97	------	9.64
May	199.68	155.18	44.50	------	-----
June	(11.70)	(210.00)	102.26	96.04	-----
July	1,024.41	-----	89.55	59.34	875.52
Aug.	338.75	333.75	-----	------	5.00
Sept.	(192.58)	(210.00)	17.42	------	-----
Oct.	-----	-----	-----	------	-----
Nov.	-----	-----	-----	------	-----
Dec.	967.69	123.75	28.45	------	815.49
TOTAL:	2,483.11	316.43	305.65	155.38	1,705.65

INSPECTIONS

In 1962, the Water Treatment Plant at Parkhill was visited regularly for the purpose of inspection by Project Engineers from the Division of Plant Operations. In addition, the Electronics Section made five trouble calls and one inspection visit while the Maintenance Section made one inspection trip which is taken annually to check thoroughly every piece of equipment in the plant.

On February 4th, 1962 a meeting with members of the Parkhill Public Utilities Commission and Municipal Council was held in the P.U.C. offices to discuss the operation of the plant.

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